

proposes to maintain a 55 foot wide forested buffer. In areas where sheet flow is not possible, stormwater will be collected in ditches along the downhill side of the roads. Sixteen feet of the proposed 32 foot wide crane paths and most of the turbine pad areas, specifically the construction laydown area, for each turbine will be allowed to re-vegetate in order to provide additional buffering capacity.

In addition to roadside buffers described above, a portion of one access road (Station 53+50) and the crane path (Stations 21+50 to 97+00) will be bordered by a 100 foot wide Phosphorous Restriction zone. The zone also includes roadside and ditch turnout buffers beginning at station 99+14. This zone totals approximately 132 acres. The zone encompasses all developed area within the Ellis Pond watershed and includes most of the proposed turbines and associated turbine pads. While selective cutting of vegetation will occur in this area, no grubbing or soil disturbance will be permitted.

2.) Generator Lead Buffers. The area within the generator lead corridor will require vegetative cutting to meet line safety and reliability goals. The applicant proposes to employ ISO-New England safety standards to vegetative management of the collector line. Corridor construction and maintenance procedures will provide for the retention of low ground cover to the greatest extent practicable during construction, restoration and stabilization of areas affected by construction, and ongoing maintenance activities with the intention of promoting long-term growth of low vegetation.

3.) Stream Buffers. The applicant proposes to maintain a minimum of a 100 foot wide forested buffer along streams crossed by the collector line and streams adjacent to new access roads. The use of herbicides will be prohibited within all waterbody buffers and within 25 feet of any wetlands with water visible at the surface. Additionally, no refueling or maintenance of equipment will be performed within waterbody buffer areas. No permanent structures will be placed within 100 feet of any stream. Further, tree cutting in stream buffer areas will be limited to hand removal of capable species greater than eight feet.

4.) Vernal Pool Buffers. The applicant proposes to maintain a minimum of a 250 foot vegetated buffer, as measured from the edge of the habitat on each side, for significant vernal pools that are present within the vicinity of the proposed project. Clearing for developed area and electrical infrastructure will not result in greater than 25 percent of habitat conversion of any significant vernal pool, which includes the vernal pool depression and its critical terrestrial habitat. Herbicide use within this buffer will be prohibited; no refueling or maintenance of equipment will be conducted within this buffer.

Vegetation Maintenance Plan. The applicant submitted a vegetation management plan (Appendix 10-1 of the application) entitled "Post-Construction Vegetation Management Plan" prepared by James W. Sewall Company and Stantec Consulting and dated November 2008 with the last revision date being July 2009. The plan summarizes vegetation maintenance methods and procedures that will be utilized by the applicant for the transmission line corridor, describes maintenance requirements and restrictions

associated with waterbody crossings, and describes the procedures to be followed in the vicinity of vernal pools. Further, the plan provides procedures for managing or removing osprey nests built on power line structures, describes a system for identifying restricted areas, and summarizes training requirements for personnel and contractors.

Within 60 days of beginning operation, all buffer areas must be permanently marked on the ground. The deed for the parcel that contains any portion of the designated buffer must contain deed restrictions relative to the buffer and have attached to it a plot plan for the parcel, drawn to scale, that specifies the location of the buffer. Prior to the placement of the proposed project on-line, the applicant must submit a copy of the recorded deed restriction including the plot plan to the BLWQ.

The Department finds that the applicant has made adequate provision for buffer strips provided that the applicant complies with the post-construction vegetation management plan submitted in the application, and that all visual screening buffers and stormwater treatment buffers must be permanently marked on the ground pursuant to Chapter 500 Stormwater Management rules within 60 days of placing the Record Hill Wind Project on-line. The applicant must record deed restrictions prior to the placement of the proposed project on-line with the Registry of Deeds for the subject parcel(s). The deed restrictions must have attached a plot plan for the parcel(s), drawn to scale, that specifies the location of all stormwater buffers on the parcel. The applicant shall submit a copy of the recorded deed restrictions, including the plot plan(s), to the BLWQ within 90 days of the recording.

10. SOILS:

The applicant submitted a Class C Medium-High Intensity Soil Survey and a Medium-high to High Intensity Soil Survey for the proposed project site prepared by Albert Frick Associates, Inc. and dated October 31, 2008. The applicant also submitted a Class B High-Intensity Soil Survey for the collector substation, prepared by Statewide Surveys, Inc. and dated July 3, 2009. Both reports are in the appendices of Section 11 in the application. These reports concluded that the soils are generally appropriate for the proposed construction activities. The applicant also conducted an analysis of the potential for acid rock drainage as can be seen in the report entitled Geological Reconnaissance Preliminary Acid Rock Drainage Evaluation Proposed Rollins Mountain Wind Power Project", prepared by SW Cole Engineering, Inc. and dated June 13, 2008.

All of the reports were reviewed by staff from the Division of Environmental Assessment (DEA) of the BLWQ. DEA also reviewed a Blasting Plan submitted by the applicant and outlining the proposed procedures for blasting in the area of the turbine foundations, the proposed access roads in areas requiring significant cut, and underground power line trenches. DEA commented that the blasting plan does not include specific limits for ground vibration. For any blast at which ground vibration is monitored, the applicable limit on ground vibration at inhabitable structures not owned or controlled by the developer is the frequency-dependent standard in Figure B-1 of Appendix B, U.S. Bureau

of Mines Report of Investigations 8507. The applicant acknowledged DEA's comments and has agreed to apply the specific limits in Figure B-1 for ground vibration.

Prior to any blasting on the project site, the applicant must submit a pre-blast survey to the Department for review and approval. All blasting must be conducted in compliance with the provisions set forth by 38 M.R.S.A. § 490-Z (14). In addition, the applicant must follow all applicable limits on ground vibration at inhabitable structures not owned or controlled by the applicant in conformance with the U.S Bureau of Mines Report of Investigations 8507 and a revised blasting plan incorporating this change must be submitted to the Department prior to construction.

The applicant does not anticipate using a rock crusher on the project site during the construction of the proposed project; however, if a rock crusher is required to be utilized on site, the applicant must insure that the crusher is licensed by the Department's Bureau of Air Quality and is being operated in accordance with that license.

The Department finds that the applicant has submitted evidence that the soils on the project site present no limitations to the proposed project that cannot be overcome through standard engineering practices provided that the applicant submits a pre-blast survey to the Department for review and approval, prior to any blasting on the project site, and if a rock crusher will be utilized on site, the applicant must insure that the crusher is licensed by the Department's Bureau of Air Quality and is being operated in accordance with that license.

#### 11. STORMWATER MANAGEMENT:

The proposed project includes approximately 18.4 acres of new impervious area and 18.8 acres of new developed area. Approximately 0.7 acres of developed area currently exists due to existing logging roads. The proposed project lies within the watershed of the Swift River, Meadow Brook, and Ellis Pond (also known as Roxbury Pond or Silver Lake). The applicant submitted a stormwater management plan based on the basic, general, and flooding standards contained in Department Rules, Chapter 500. Under the general standards, the applicant is applying the phosphorous methodology to address impacts to Ellis Pond. Stormwater quality treatment will be achieved with various roadside, turnout, and level spreader buffers, and two grassed underdrained soil filters. Stormwater flooding mitigation will be achieved with lengthening flow paths and disconnecting impervious area through the use of buffers and by two small detention areas.

##### A. Basic Standard:

(1) Erosion and Sedimentation Control: The applicant submitted an Erosion and Sedimentation Control Plan (Section 14 of the application) that is based on the performance standards contained in Appendix A of Chapter 500 and the Best Management Practices outlined in the Maine Erosion and Sediment Control BMPs, which were developed by the Department. This plan and plan sheets containing erosion control

details were reviewed by the Division of Watershed Management (DWM) of the Department's Bureau of Land & Water Quality. DWM commented that, as stated in the erosion control plan, minimum erosion control measures will need to be implemented. However, based on site and weather conditions during construction, additional erosion and sedimentation control measures may be necessary. All areas of instability and erosion must be repaired and maintained immediately during construction until the site is completely stabilized or vegetation is established.

Erosion control details will be included on the final construction plans and the erosion control narrative will be included in the project specifications to be provided to the construction contractor. Given the size and nature of the project site, the applicant must retain the services of a third party inspector in accordance with the Special Condition for Third Party Inspection Program, which is attached to this Order. Prior the start of construction, the applicant must conduct a pre-construction meeting to discuss the construction schedule and the erosion and sediment control plan with the appropriate parties. This meeting must be attended by the applicant's representative, Department staff, the design engineer, the contractor, and the third-party inspector.

Interested parties stated that erosion occurred at the site of a previously permitted wind energy development, known as Kibby Mountain. In part due to this experience, interested parties assert that erosion is likely to occur at the proposed project site.

DWM commented that reports from the third party inspector for Kibby Mountain have indicated that major erosion control issues resulted from the logging and clearing practices on the site. These factors were not under the control of the developer of the permitted wind energy development. Rather, the erosion control issues on that site were the result of activities undertaken by the property owner. For the proposed project, the applicant must retain the services of a third party inspector to make weekly visits to the project site and report on the erosion and sedimentation control efforts, problems encountered during their inspections, if any, and recommend corrective measures taken. This is in addition to the contractors own efforts at compliance, additional site visits from Department staff and, the applicant's reviewed and approved erosion and sedimentation control plan as guidance to the level of effort necessary to conduct the project.

(2) Inspection and Maintenance: The applicant submitted a maintenance plan that addresses both short and long-term maintenance requirements. This plan was reviewed by, and revised in response to the comments of DWM. The maintenance plan is based on the standards contained in Appendix B of Chapter 500. The applicant will be responsible for the maintenance of all common facilities including the stormwater management system.

(3) Housekeeping: The proposed project will comply with the performance standards outlined in Appendix C of Chapter 500.

Based on DWM's review of the applicant's erosion and sedimentation control plan and the maintenance plan, the Department finds that the proposed project meets the Basic Standards contained in Chapter 500(4)(A).



#### B. General Standard:

The applicant's stormwater management plan includes general treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. Mitigation for the non-linear portion of the project (the collector substation and O&M building) is being achieved by using Best Management Practices that will control runoff from 96% of the impervious area and 95% of the developed area. The proposed access roads meet the definition of "a linear portion of a project" in Chapter 500 and the applicant is proposing to reduce runoff volume to 82% of the volume from the impervious area and 82% of the developed area.

Because of the proposed project's location in the watershed of Ellis Pond, stormwater runoff from the project site will be treated to meet the phosphorus standard outlined in Chapter 500(4)(C). The applicant's phosphorus control plan was developed using methodology developed by the Department and outlined in "Phosphorus Control in Lake Watersheds: A Technical Guide for Evaluating New Development". For this project, the Permitted Phosphorus Export is 6.369 pounds of phosphorus per year. The applicant proposes to remove phosphorus from the project's stormwater runoff by utilizing the stormwater treatment methods discussed above and incorporating a Phosphorous Restriction Zone totaling approximately 132 acres discussed in Finding 9. The predicted phosphorus export for the project site based on the applicant's model is 6.368 pounds per year. The proposed stormwater treatment will be able to reduce the export of phosphorus in the stormwater runoff below the maximum permitted phosphorus export for the site.

The forested, limited disturbance stormwater buffers will be protected from alteration through the execution of a deed restriction, as described in Finding 9. The applicant proposes to use the deed restriction language contained in Appendix G of Chapter 500. Prior to the start of construction, the location of forested buffers on individual lots must be permanently marked on the ground.

Prior to the start of construction, the location of forested buffers must be permanently marked on the ground. A deed restriction must be put in place for any portion of the designated buffer and have attached to it a plot plan, drawn to scale, that specifies the location of the buffers. Prior to the start of construction, the applicant must submit a copy of the recorded deed restriction including the plot plan to the BLWQ.

The stormwater management system proposed by the applicant was reviewed by, and revised in response to, comments from DWM. After a final review, DWM commented that the proposed stormwater management system is designed in accordance with the Chapter 500 General Standard. DWM recommended that the applicant retain the services of a professional engineer to inspect the construction and stabilization of the road ditch turnouts and stone bermed level spreaders to be built on the site. Inspections must consist of weekly visits to the site to inspect each turnout and level spreader's construction, stone berm material and placement, and settling basin from initial ground disturbance to final

stabilization. If necessary, the inspecting engineer will interpret the turnouts' and spreaders' location and construction plan for the contractor. Once the turnouts and spreaders are constructed and stabilized, the inspecting engineer will notify the Department in writing within 14 days to state that the turnouts and spreaders have been completed. Accompanying the engineer's notification must be a log of the engineer's inspections giving the date of each inspection, the time of each inspection, the items inspected on each visit, and include any testing data or sieve analysis data of the berm media.

The applicant must also retain the services of a professional engineer to inspect the construction and stabilization of the grassed underdrained soil filters. The same protocol as listed above must be followed. The engineer must include data that includes information about the filters' effectiveness and determine any maintenance items needed.

Based on the stormwater system's design and DWM's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the Chapter 500 General Standards provided that the applicant adheres to the required protocol for inspections of the ditch turnouts, level lip spreaders, and grassed underdrained soil filters as outlined above.

#### C. Flooding Standard:

The applicant is proposing to utilize a stormwater management system based on estimates of pre- and post-development stormwater runoff flows obtained by using Hydrocad, a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service and detains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency.

DWM reviewed the analysis of the watersheds involved in the proposed project for flooding. DWM commented that the nature of the linear project creates relatively little impervious area in any one sub-watershed. The applicant analyzed the impact of the conversion of cover type on the wider watershed area. Because the project design results in a large amount of disconnected impervious area keeps flows from exiting the site in a concentrated flow and lengthens the flow path in a manner that will mitigate for local flooding impact, DWM further commented that the proposed system is designed in accordance with the Chapter 500 Flooding Standard.

Based on the system's design and DWM's review, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the Chapter 500, Flooding Standard for channel limits and runoff areas, and peak flow from the project site.

#### 12. GROUNDWATER:

The proposed project is located across two U.S. Geological Survey quadrangles: Roxbury and Ellis Pond. The applicant submitted significant sand and gravel aquifer data for these

areas from the Maine Geological Survey. The Maine Geological Survey data indicates that the nearest aquifer is located over one mile east of the proposed project near the Swift River. A single bedrock well is proposed to serve domestic needs at the project's Operations & Maintenance building. This location for a well will not affect any significant sand and gravel aquifers.

Spill Prevention, Control, and Countermeasures (SPCC) plan. The applicant stated that the potential sources of groundwater contamination during construction will be fuel and hydraulic and lubricating oils used in the operation of vehicles and construction equipment. The applicant submitted a set of procedures for handling these materials and preventing spills should such an event occur. The Department's Division of Environmental Assessment (DEA) reviewed the applicant's draft SPCC plan and commented that the applicant must submit a final SPCC Plan for operation of the facility to the Department for review and approval prior to the start of construction. The applicant must also apply setbacks proposed in the current plan for buffer areas between petroleum storage and fueling areas and wells and protected resources to areas of herbicide usage or other use of chemicals and fuels in maintenance of the right-of-way. Prior to any construction, site preparation, or maintenance, the applicant must flag the boundaries of any such setbacks in the field. All staff must receive suitable training to recognize and comply with these setback markers and requirements. Prior to any application of herbicides or other use of chemicals or petroleum products in maintenance of the right of way, the right of way must be checked for any new construction that would require establishment of setbacks for herbicides or other use of chemicals or petroleum products, and any such setback must be clearly flagged in the field.

The Department finds that the proposed project will not have an unreasonable adverse effect on ground water quality provided that the applicant submits a final SPCC plan for operation of the facility to the Department for review and approval prior to the start of construction and adhere to additional procedures as discussed above.

13. WATER SUPPLY:

The proposed project will not require water supply for the operation of the wind turbines or the electrical equipment. The only anticipated demand for water will be at the Operations & Maintenance building. A private water well will be drilled on-site to supply potable water to the Operations & Maintenance building. During construction, the applicant or its contractors will supply drinking water to workers. Drinking water will be supplied either from an existing public water supply or by bottled or other bulk water supply.

Non-potable water will be needed for dust abatement at a rate of up to 20,000 gallons per day during construction. This water will not be withdrawn from a groundwater source or waterbody. Rather, a 4,000 gallon tanker truck will bring water to the site from the boat ramp in Roxbury Pond Village. Pursuant to 06-096 Chapter 587 (6) of the Department's Rules, In-stream Flows and Lake and Pond Water Levels, this activity will not change the naturally occurring water levels of the Ellis Pond or surrounding lakes given the limited

volume of the withdrawal amount. Concrete required for the project will not be produced on-site, but instead will be provided by existing batch plants.

The applicant submitted an assessment of groundwater supplies that are available on the project site and a map provided by the Maine Geological Survey which denotes the locations of bedrock wells within the vicinity of the project site (submitted as Appendix 16-1 in Section 15 of the application). This assessment was reviewed by the Department's divisions of Environmental Assessment, who commented that there is adequate groundwater resource for the proposed project provided that the applicant submits a site plan denoting the final location of the water supply well to the BLWQ within 7 days of its installation.

The Department finds that the applicant has made adequate provision for securing and maintaining a sufficient and healthful water supply, provided that the applicant adheres to 06-096 Chapter 587 (6), In-stream Flows and Lake and Pond Water Levels, during construction when withdrawing water from Ellis Pond for the purpose of dust abatement, and provided that the applicant submits a site plan denoting the final location of the water supply well to the Department within seven days of its installation.

14. WASTEWATER DISPOSAL:

The applicant stated that the only potential generation of wastewater would be from the proposed Operations & Maintenance building from a staff of nine employees or less. This equates to approximately 135 gallons of wastewater per day. There will be no commercial or industrial wastewater generation associated with the proposed project.

The design of the wastewater system includes a septic tank with a standard stone bed septic system that meets the Subsurface Wastewater Disposal Rules. The septic disposal system will be built on suitable soils and will be sited on the Maintenance Facility Lot a minimum of 100 feet from the water supply well. The applicant submitted a disposal area plan, dated July 10, 2009 and a subsurface wastewater disposal system design (HHE-200 form) dated July 10, 2009, both prepared by a professional soil evaluator from Stantec Consulting.

The applicant also submitted the soil survey map and report discussed in Finding 10 and an analysis of potential impacts to off-site groundwater quality resulting from on-site wastewater disposal prepared by a certified geologist. This information was reviewed by DEA.

Based on DEA's comments, the Department finds that the proposed wastewater disposal system will be built on suitable soil types.



15. SOLID WASTE:

All trees located in the footprint of the proposed turbine pads and expanded roads will be harvested and sold for commercial use. Smaller woody vegetation will be mulched and used for moisture retention on the site.

The development of the site and construction of the turbines will generate approximately 97 cubic yards of construction debris. By letter, dated November 12, 2008, Archie's, Inc., a Department-licensed non-hazardous waste hauler, stated that the company is capable of and willing to transport construction waste before and after construction and during operation of the project. All construction and demolition debris generated will be disposed of at Waste Disposal Services of Maine's Crossroads facility, which is substantial compliance with the Solid Waste Management Regulations of the State of Maine. This facility is located in Norridgewock.

Solid waste produced during operation of the proposed project is estimated to be less than 100 pounds of waste per week. Once in operation, domestic waste will be disposed of in a dumpster which will be sited at the proposed Operations & Maintenance building. The applicant will contract with a licensed waste hauler to periodically empty the dumpster and transport waste to a licensed waste disposal facility.

The Department's Bureau of Remediation and Waste Management (BRWM) reviewed the applicant's proposal for solid waste disposal, and stated that the proposal is adequate provided that mulch depth of processed brush is no more than 2 to 4 inches, and the mulch is placed within 30 days of completing the brush process.

Based on the above information and BRWM's review, the Department finds that the applicant has made adequate provision for solid waste disposal provided that mulch depth of processed brush is no more than 2 to 4 inches, and the mulch is placed within 30 days of completing the brush process.

16. FLOODING:

The proposed project crosses headwaters of streams in the ridge and connector line areas.

The applicant consulted flood zone maps of the Town of Roxbury (Oxford County) to determine if the proposed project would cross a mapped flood zone. The maps indicate that no flood zones are crossed by the proposed project. The flood zone maps can be seen on Page 19-1 and 19-2 in the application.

Based upon information in the record, the Department finds that the proposed project is unlikely to cause or increase flooding or cause an unreasonable flood hazard to any structure.

17. WETLAND AND WATERBODY IMPACTS:

Freshwater Wetlands. The applicant identified a total of 221 freshwater wetlands areas within the project site. Of this total, 66 wetlands were identified within the ridgeline turbine corridor, 103 wetlands were identified within the access road corridor, and 52 wetlands were identified within the generator lead corridor. All of the wetlands located on the project site were identified as either forested, scrub-shrub, or emergent. A total of forty-eight of the 222 wetlands that were identified are classified as Wetlands of Special Significance (WOSS) in accordance with Chapter 310 § 4 of the Department's Wetlands and Waterbodies Protection rules.

In addition to the wetlands located on the project area, a total of 77 streams were also identified within the project area. The applicant identified a total of 8 streams within the ridgeline turbine corridor, 50 streams were identified within the access road corridor, and 19 streams were identified within the generator lead corridor.

In order to construct the proposed project, the applicant proposes to permanently fill 13,362 square feet of forested, scrub shrub, and emergent freshwater wetlands and to clear 30,172 square feet of wetland vegetation due to construction of the transmission lines. Approximately 12% of the proposed wetland fill is a result of expanding Mine Notch Road.

Rivers, Streams and Brooks. In total, there are 11 delineated streams that are crossed by the proposed project. The access roads will cross four of these streams; three of these crossings will result from new road construction. These four streams include a small perennial stream and three intermittent streams. The generator lead crosses the remaining seven streams; however, no in-stream work is anticipated for these crossings. The applicant proposes to implement a vegetative management plan and impose a 100 foot riparian stream buffer width long all streams as described in Finding 11 to minimize impacts to fisheries. MDIFW reviewed the proposed project and commented that all in-stream work must be conducted from July 15 to September 30.

Chapter 310 interprets and elaborates on the NRPA criteria pertaining to wetlands. The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would cause a loss of wetland area, functions and values and there is a practicable alternative to the project that would be less damaging to the environment. Each application for a wetland alteration permit must provide an analysis of alternatives in order to demonstrate that a practicable alternative does not exist.

A. Avoidance. The applicant submitted an alternative analysis for the proposed project completed by Stantec Consulting and dated December 1, 2008 with the latest revision date being July 10, 2009. The applicant stated that the site of the proposed project was chosen because it best meets the project purpose of developing a commercial scale wind energy project in Maine that delivers renewable energy to customers in Maine and New England. The applicant conducted a wide reaching survey of potential wind

power sites (10) before selection of the project site. The applicant considered numerous factors in analyzing potential sites for development. These factors include wind quality, proximity to transmission infrastructure, general site topography and accessibility, land use compatibility, and overall environmental impacts. The applicant used a scoring matrix to weigh each of these factors, and evaluate each site. This scoring system can be seen in Appendix 1A-1 of the application. After consideration of the factors at each of the alternative sites, the applicant determined that proposed project site represents the least environmentally damaging alternative as compared to the other alternative sites that were considered. Overall, the applicant proposes to permanently fill 13,362 square feet of forested, scrub shrub, and emergent freshwater wetlands and to clear 30,172 square feet of wetland vegetation due to construction of the transmission lines.

The applicant considered the following alternative sites:

- The applicant considered development in coastal Maine. Although wind quality in this area was determined to be good to excellent, the applicant identified significant land use compatibility issues and a moderate to high amount of anticipated environmental impacts.
- The applicant considered development on a coastal island off Maine. Although wind quality in this area was determined to be good to excellent, the applicant identified very poor transmission infrastructure, poor topography and accessibility, significant land use compatibility issues, and a moderate to high amount of anticipated environmental impacts.
- The applicant considered development at 6 locations in the western mountains of the State. Although wind quality in this area was determined to be good, the applicant identified fair transmission infrastructure, a range from fair to favorable, topography and accessibility, significant land use compatibility issues, and a moderate amount of anticipated environmental impacts.
- The applicant investigated a site in a central location of the State. The resulting score of the majority of the factors was fair. In addition, the applicant identified numerous existing land use conflicts and a moderate amount of environmental impacts.
- The applicant investigated a site in a western location of the State. Although wind quality in this area was determined to be good, the applicant identified a fair transmission infrastructure, fair to poor topography and accessibility, several conflicting land use compatibility issues, and a moderate amount of anticipated environmental impacts.

The applicant made several design changes to avoid wetland impacts throughout the project site. The original design anticipated access being provided by Mine Notch Road and then splitting the access road to the ridge into two distinct segments. This access design required seven stream crossings, required cutting over two miles of new road, and it would pass immediately adjacent to a complex of high functioning vernal pools. The applicant has taken measures to space turbines closely to maximize the project's electricity generation over the length of the ridge. The turbines are spaced at approximately 2.3-2.5 rotor diameters apart. This modification to the proposed project design resulted in the avoidance of large areas of wetlands.

B. Minimal Alteration. The amount of wetland and waterbodies to be altered must be kept to the minimum amount necessary for meeting the overall purpose of the project. The applicant took precautions to avoid crossing flat areas of wetlands with roads. In the areas where wetland impacts could not be avoided, the applicant minimized wetland impacts by using various techniques. Some techniques used to minimize impacts included narrowing road shoulders where possible and modifying cut and fill slopes on both roads and turbine pads. The applicant maximized buffers to allow larger riparian areas between roads and turbine pads and the wetland areas. The applicant also designed roads through some areas to ensure that they crossed at the most narrow point and would have minimal effect on the larger area's function.

Wetland impacts were considered during the design of the proposed project in areas associated with turbine development. Specifically, the applicant minimized impacts to wetlands in the location of turbine pads 1, 2, 3, 4, and 5, all of which were shifted to reduce impacts to Wetland R68 and Vernal Pool 18CF. The original design considered impacting over 25 percent of the vernal pool critical terrestrial habitat. The project design for the crane path was shifted in order to move the crane path to the west side of the turbine pads, which reduced habitat fragmentation since the western side of the ridge is actively harvested for timber and already disturbed. The design shift also moved turbines 1, 2, 3, and 4 to the north and turbine 5 to the south in order to reduce the amount of impacts to wetlands.

C. Compensation. In accordance with Chapter 310 5(C)(6)(a)(ii), compensation is not required for impacts associated with the proposed project, because the applicant is proposing to permanently alter less than 15,000 square feet of freshwater wetland.

The Department finds that the applicant has avoided and minimized wetland and waterbody impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project provided that the applicant implements the vegetative management plan contained in the application and all in-stream work be conducted from July 15 – September 30.

18. AIR QUALITY:

The applicant stated that construction activities may cause temporary effects on air quality in the form of exhaust from construction vehicles and dust from unpaved roads. However, effects will be minimal due to the location of the proposed project in a rural setting and the limited duration of construction in any one place. Routine maintenance of the transmission line will create will not create significant emissions from maintenance vehicles and will be similar to emissions currently produced by maintenance of other existing transmission lines.

Dust is likely to be a form of air emission associated with the proposed project. Dust created by construction equipment is anticipated along existing logging roads, although the level of dust created will be similar to existing ongoing logging operations in the

proposed project area. No treatment is generally applied except where safety and visibility may be problematic. However, the applicant proposes to treat some areas with calcium chloride, water, or other approved dust control agent where dust may be a nuisance to neighbors. Treatment will be on an as-needed basis as ordered by the resident engineer or timber land owner. Other areas such as construction entrances to public roads will have crushed stone pads that will limit dust and mud tracking. Dust is not anticipated to be an issue along the transmission right-of-way.

The Department finds that no significant source of air emissions has been identified with the exception of fugitive dust emissions described above.

19. ODORS:

The applicant stated that the clearing and construction phase of the proposed project will not create significant odors; however, limited, short term odors may be generated from harvesting or construction equipment.

Clearing activity will be conducted with standard forestry equipment under controlled conditions. If burning of vegetation is anticipated, burning will be accomplished in compliance with local and state open burning requirements. Any brush burning will be supervised by a construction supervisor and environmental inspector.

No significant sources of odors have been identified.

20. ALTERATION OF CLIMATE/WATER VAPOR:

The proposed project does not involve any significant sources of water vapor emissions.

21. ACCESS TO SUNLIGHT:

The proposed project will not significantly affect any adjacent properties access to sunlight.

22. SHADOW FLICKER:

According to 38 M.R.S. § 481 et seq., an applicant must demonstrate that the proposed wind energy development has been designed to avoid unreasonable adverse shadow flicker effects. Shadow flicker caused by wind turbines is defined as alternating changes in light intensity caused by the moving blade casting shadows on the ground and stationary objects. Shadow flicker is not the sun seen through a rotating wind turbine rotor nor what an individual might view moving through the shadows of a wind farm. No shadow flicker will be cast when the sun is obscured by clouds or fog or when the turbine is not rotating. The spatial relationships between a wind turbine and receptor, as well as wind direction are key factors related to shadow flicker duration. At distances of greater than 1,000 feet between wind turbines and receptors, shadow flicker usually only occurs at sunrise or sunset when the cast shadows are sufficiently long. For situations where the



rotor plane is in-line with the sun and receptor (as seen from the receptor), the cast shadows will be very narrow (blade thickness), of low intensity, and will move quickly past the stationary receptor. When the rotor plane is perpendicular to the sun-receptor "view line", the cast shadow of the blades will move within a circle equal to the turbine rotor diameter.

The applicant submitted a shadow flicker analysis, prepared by EAPC Wind Energy Services, LLC, dated November 6, 2008 with the latest revision date being May 3, 2009. This analysis can be seen in the application in Appendix 26-1. The applicant utilized WindPRO, a wind modeling software program, to model expected shadow flicker effects on adjacent properties from all 22 of the proposed turbine locations. The applicant assumed a worst case scenario prediction by assuming that the sun is shining every day and that all receptors face the turbine directly. Further, the analysis does not take vegetative screening into account between a turbine and a receptor.

The Department generally recommends that an applicant conduct a shadow flicker model out to a distance of 1,000 feet or greater from a residential structure. The applicant ran the shadow flicker model out to a distance at 1,000 meters (3,280 feet) from each turbine. This number is over three times the distance recommended by the Department. The analysis was conducted at this distance because there are no residential structures at a distance less than 2,345 feet from the nearest proposed turbine location.

Maine currently has no numerical regulatory limits on exposure to shadow flicker; however, the industry commonly uses 30 hours per year as a limit to reduce nuisance complaints. The analysis identified four receptor sites in the vicinity near the proposed project site. The four receptor sites were field-verified as residential dwellings. Results of the modeled receptors are as follows:

<u>Receptor #</u>	<u>Distance to Nearest Turbine</u>	<u>Anticipated Shadow Flicker Hours</u>
463	1000 meters	0
465	891 meters	0
467	954 meters	0
468	715 meters	0

Interested parties stated that many autistic children are prone to photosynthetic seizures. Interested parties expressed concern that the proposed project would have a potential negative health effect on autistic children as caused by shadow flicker when reflected off Roxbury Pond. Other interested parties expressed concern regarding the potential health effect to the general public as shadows are cast over Roxbury Pond.

The applicant researched the interested parties' concerns with the National Academy of Sciences and the Epilepsy Foundation. According to a publication issued by the National Academy of Sciences, entitled "Environmental Impacts of Wind-Energy Projects" (2007): "Flicker frequency due to a turbine is on the order of the rotor frequency (i.e., 0.6-1.0 Hz), which is harmless to humans." According to the Epilepsy Foundation, "only frequencies above 10 Hz are likely to cause epileptic seizures. (As a reference,

frequencies of strobe lights used in discotheques are higher than 3 Hz but lower than 10 Hz.)” Based upon this information and results of the shadow flicker analysis, the applicant concluded that the proposed project avoids unreasonable shadow flicker effects.

The Department finds that the shadow flicker modeling conducted by the applicant is credible and that no shadow flicker effects are anticipated to occur at any given receptor site. The applicant did not submit an analysis of wind direction and wind speed at each turbine, average cloud cover, obstacles, or the available average sunshine hours for the region at different times of the year due to the fact that there are no receptor sites less than 2,345 feet from the nearest turbine location. However, it is reasonable to conclude that based upon the results of the shadow flicker modeling, shadow flicker effects at each of the receptor locations will not be increased by these factors when considering the distance of the receptor sites from the nearest turbine location.

Based on this evidence, the Department finds that the applicant has made adequate provision for the control of unreasonable shadow flicker from the proposed project.

23. PUBLIC SAFETY:

The proposed project will use Siemens 2.3 MW SWT-2.3-93 wind turbine generators. The turbines have been certified by Det Norske Veritas, a risk management company, to withstand Class IIA wind gusts, as defined by the International Electrotechnical Commission Standard 61400-1 “Wind Turbine Generator Systems-Part 1: Safety Requirements.” The Standard considers an extreme wind speed at hub height of 42.5 meters per second. The applicant submitted evidence that the Siemens SWT-2.3-93 wind turbine meets acceptable safety standards in the form of Statements of Compliance (Type Certificate and Management System Certificate) issued by Det Norske Veritas dated January 11, 2007 and May 20, 2009.

The Department recognizes that locating wind turbines a safe distance away from any occupied structures, public road or other public use area is of utmost importance. In establishing a recommended safety setback, the Department considered industry standards for wind energy production in climates similar to Maine, as well as the guidelines recommended by certifying agencies such as Det Norske Veritas. Based on these sources, the Department recommends that all wind turbines be setback from the property line, occupied structures or public areas, at a minimum of 1.5 times the maximum blade height of the wind turbine. The maximum height of the Siemens SWT-2.3-93 is 415 feet from the ground to the tip of the fully extended turbine blade. Based on the Department minimum setback specifications, the setback distance to the nearest property line is 622.5 feet.

Twenty of the 22 proposed turbine locations are located more than 622.5 feet from the property boundary of the Record Hill Wind Project. There are two parcels within 1.5 times the maximum blade height of the turbines; neither parcel is presently used for residential purposes. The nearest turbine to the property boundary of one of the parcels is 175 feet away; the nearest turbine to the property boundary of the other parcel is 400 to

450 feet away. The applicant submitted a waiver from each of the affected property owners, dated November 20, 2008 and December 19, 2008.

The applicant stated that a public safety easement will be acquired with the property owners in order to provide further documentation. The applicant shall submit a copy of the recorded agreement to the Department within 60 days of its recording.

The Department finds that the applicant has provided documentation in the form of standards of compliance by the manufacturer that the wind generation equipment has been designed to conform to applicable industry safety standards and has demonstrated that the proposed development has been sited such that it will not present an unreasonable safety hazard to adjacent properties or adjacent property uses provided that the applicant submits a redacted copy of the executed public safety agreement to the Department within 60 days of its recording.

24. DECOMMISSIONING PLAN:

The Siemens SWT-2.3-93 wind turbine generators are designed and certified by independent agencies for a minimum expected operational life of 20 years. In order to facilitate and ensure appropriate removal of the wind generation equipment when it reaches the end of its useful life, the Department requires an applicant to demonstrate, in the form of a decommissioning plan, the means and methods by which decommissioning will be accomplished. The applicant submitted a decommissioning plan as Section 29 of the application. The decommissioning plan includes a description of the trigger for implementing the decommissioning plan, a description of work required, an estimate of decommissioning costs, and a demonstration of financial assurance.

- 1.) Description of trigger for implementation of decommissioning. The applicant states that the wind generation facility will be decommissioned when and if it ceases to generate electricity for a continuous period of twelve months. In the case of mitigating circumstances such as force majeure event, the applicant may submit to the Department for review and approval, reasonable evidence that the project has not been abandoned and should not be decommissioned.
- 2.) Description of work. The description of work contained in Section 29 of the application was developed by Reed and Reed, Inc., outlines how the turbines and other components of the proposed project will be dismantled using standard best management practices. Pursuant to Department guidelines, subsurface components will be removed to a minimum of 24 inches below grade, facilities will be removed and salvaged, and disturbed areas will be re-seeded. At the time of decommissioning, the owner must submit a plan for continued beneficial use of any wind energy development component left on-site to the Department for review and approval.
- 3.) Cost estimates for decommissioning. The applicant stated that decommissioning costs are estimated at \$37,646 per turbine and \$59,500 for removal of the proposed Operations & Maintenance Building. The total cost of decommissioning, minus